

Chapter 5

The Tracheline Spider Genus *Paccius* (Araneae, Corinnidae) in the Parc National de Marojejy, Madagascar

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Abstract

Five new species of the tracheline spider genus *Paccius* Simon are described from the Parc National de Marojejy, Madagascar, including the first known females of the genus. Males have extraordinarily modified setae on the palpal tibia that may serve to disperse pheromones or a secretion that forms an epigynal plug in mated females. All five species found at Marojejy appear to be endemic to the area as well as altitudinally segregated: *P. angulatus* at 450 m, *P. griswoldi* and *P. scharffi* (belonging to different species groups) at 700–800 m, *P. quinteri* at 1625 m, and *P. elevatus* at 1875 m.

Résumé

Cinq nouvelles espèces d'araignée tracheline genre *Paccius* Simon ont été décrites à partir des spécimens collectés dans le Parc National de Marojejy, Madagascar. Parmi elles se trouvait le premier individu de sexe femelle connu appartenant à ce genre. Chez les mâles, les barbillons du tibia sont extraordinairement modifiés et sont remplacés par des poils raides qui doivent leur servir pour disperser les phéromones ou la sécrétion qui forme le bouchon épigynal des femelles avec lesquelles ils viennent de s'accoupler. Toutes les cinq espèces trouvées à Marojejy paraissent être endémiques de l'aire en question de même qu'elles semblent être réparties selon l'altitude: *P. angulatus* à 450 m, *P. griswoldi* et *P. scharffi* (appartenant à différents groupes d'espèces) à 700–800 m, *P. quinteri* à 1625 m, et *P. elevatus* à 1875 m.

Introduction and Background

The spider genus *Paccius* Simon 1898 is an obscure taxon. The type species was originally described as *Trachelas madagascariensis* by Simon (1889) on the basis of a single male, in poor condition, from an unspecified locality on the island. In his famous *Histoire naturelle des araignées*, Simon originally (1897: 180) retained the species in *Trachelas* L. Koch 1872, a genus that served (then and now) as a "wastebasket" group for relatively unmodified trachelines. In a supplement to

that consideration, however, Simon (1898a, p. 216) indicated that he had recently had the opportunity to study additional specimens, and established the genus *Paccius*, with *T. madagascariensis* as its type. Simon also included two additional species, *P. quadridentatus* from the Seychelles (subsequently described by Simon, 1898b, p. 384) and *P. mucronatus*. Bonnet (1958, p. 3273) considered *P. mucronatus* a nomen nudum, but Simon's (1898a) discussion provides putatively diagnostic information (and even a type locality, "Sainte-Marie de Madagascar"), and the name is unquestionably available.

Simon published no illustrations of any of the three species, however, and the genus has (perhaps therefore) remained in obscurity. Benoit

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(1978) reported on *P. quadridentatus* from the Seychelles, illustrating a male and describing the female, but his specimens are clearly just misidentified members of the widespread, synanthropic corinnid genus *Oedignatha* Thorell 1881. In other words, males of three species of *Paccius* were very briefly described a century ago, females of the genus remain unknown, and no illustrations have appeared in the literature. Through the courtesy of Dr. Christine Rollard of the Muséum National d'Histoire Naturelle (MNHN), Paris, types of all three Simon species have been available for comparison with the material described below.

The absence of modern information on *Paccius* is especially remarkable, for at least two reasons. First, available collections, fragmentary as they are, nevertheless indicate that the genus has radiated extensively on Madagascar; there may be as many as 25 species on the island (as well as others from the Comoro Islands, La Réunion, and Mauritius). All the species seem to be narrowly endemic, so that the genus has great promise as a subject for cladistic biogeography. Second, the male palpal morphology is very unusual. The tibial apophysis bears highly modified setae, one of which is enormously enlarged and elaborated into a scooped-out channel (Figs. 5-1, 5-2). Because the channel appears to open into the interior of the segment, it may be used for dispersing pheromones or the secretions that are used to produce the epigynal plugs frequently found in (presumably mated) females.

Here I describe just those specimens of *Paccius* that have been taken in the Parc National (PN) de Marojejy, Madagascar, where there appear to be at least five species, all of which are new to science and which are in large part altitudinally separated (the only two species that have been taken at the same altitude, *P. griswoldi* and *P. scharffi*, belong to different species groups within the genus). The collections studied include both those of the recent expedition (currently housed in the American Museum of Natural History, AMNH) as well as those made by Dr. J. Coddington and colleagues in 1993 and housed in the National Museum of Natural History, Smithsonian Institution (USNM).

Paccius angulatus, new species (Figures 5-1, 5-2)

TYPE—Male holotype taken in a Malaise trap at 450 m on a tributary of the Manantenina River,

8.0 km NW of Manantenina, in the Parc National de Marojejy, 14°26.2'S, 49°46.5'E, Antsiranana Province, Madagascar (13–24 October 1996; E. Quinter, T. Nguyen), deposited in AMNH.

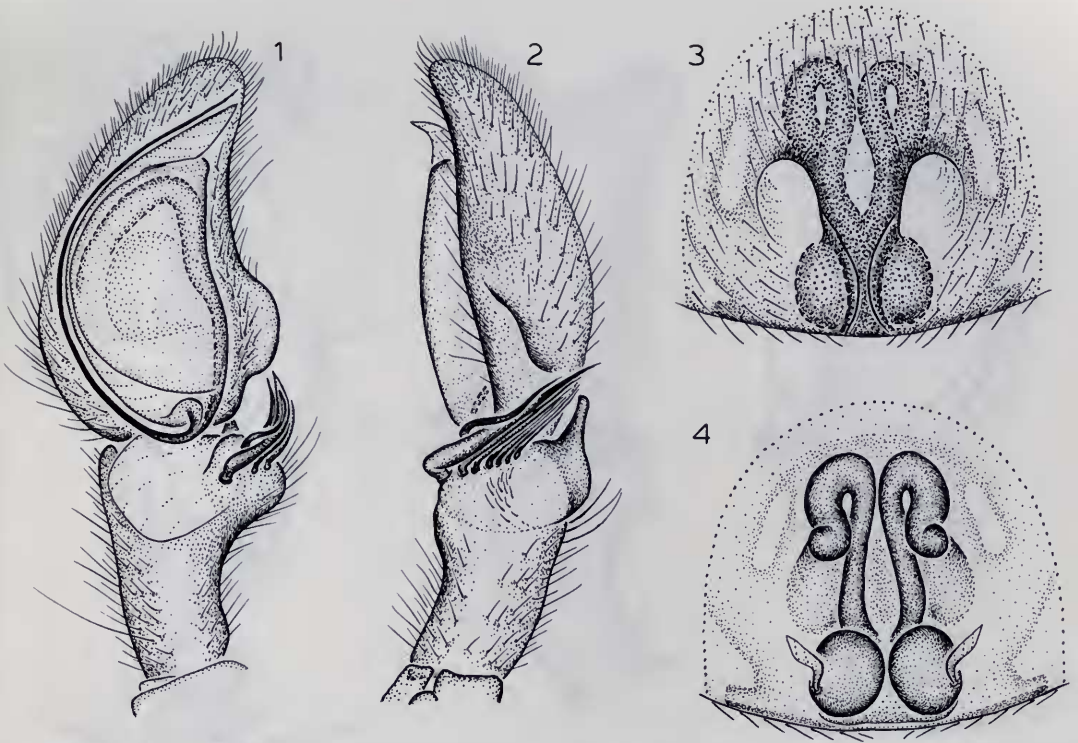
ETYMOLOGY—The species name refers to the shape of the base of the male retrolateral tibial apophysis.

DIAGNOSIS—Males resemble those of *P. madagascariensis* but have a much smaller retrolateral expansion on the cymbium (Fig. 5-1), only one (rather than two) modified tibial seta dorsal of, and overlapping, the large channelized seta (Fig. 5-2), and in having a dorsally expanded base on the tibial apophysis itself (Fig. 5-2).

MALE—Total length, not including chelicerae, 8.6 mm. Carapace dark red, entire surface covered with procurved rows of tubercles. From above, both eye rows almost straight, posterior row wider than anterior; from front, both rows slightly procurved; anterior median eyes largest, posterior medians smallest, lateral subequal; anterior medians separated by less than their diameter, farther from anterior laterals; posterior medians separated by twice their diameter, by three times their diameter from posterior laterals; lateral eyes of each side separated by their diameter; median ocular quadrangle wider than long, wider in back than long. Clypeal height less than anterior median eye diameter; chilum large, triangular, pointed and protuberant medially. Chelicerae dark red, protuberant, with four teeth on each margin; retromargin with lobe-shaped extension at base of fang. Labium and endites dark red; labium narrowed at about one-fourth its length, truncate distally; endites depressed along medial edges but without distinct median grooves. Sternum dark orange, sides granulate, with triangular extensions to and between coxae, not fused with epimeric sclerites, which extend around fourth coxae, separating them from pedicel.

Abdomen long, white, with orange epigastric scutum encircling pedicel and occupying anterior surface of dorsum; large, orange dorsal scutum covering almost all of dorsum anteriorly, all of dorsum posteriorly; venter with four irregular, longitudinal rows of small, orange sclerites. Epigastric scutum with arm-shaped posterolateral extensions extending around booklung openings, which are bordered posteriorly by pair of rectangular, sclerotic strips. Anterior lateral spinnerets two-segmented, approximate, well removed from tracheal spiracle; posterior median spinnerets short, tubular; posterior lateral two-segmented.

Leg formula 1423; leg I orange, other legs yel-



FIGS. 5-1 to 5-4. 1, 2, *Paccius angulatus*, new species. 3, 4, *P. elevatus*, new species. 1, left male palp, ventral view; 2, same, retrolateral view; 3, epigynum, ventral view; 4, same, dorsal view.

low; spines absent, metatarsi and tarsi I, II scopulate, with two ventral rows of black denticles; metatarsi III, IV with distal preening brushes; two dentate claws accompanied by dense claw tufts; trochanters unnotched.

Palpal tibia distally expanded, ventral portion of expanded area unsclerotized, bearing three enlarged setae; median seta boat-shaped, with interior channel; distal seta sinuous, crossing over into channel of median seta at about half its length; retrolateral tibial apophysis with large, expanded, angular base (Fig. 5-2); cymbium with retrolateral expansion occupying only about one-fifth of cymbial length (Fig. 5-1); embolar base slightly excavated.

FEMALE—Unknown.

OTHER MATERIAL EXAMINED—None.

Paccius elevatus, new species

(Figures 5-3, 5-4)

TYPE—Female holotype taken beating vegetation at 1875 m at the source of the Andranomifototra River, 11.0 km NW of Manantenina, in the

Parc National de Marojejy, 14°26.8'S, 49°44.1'E, Antsiranana Province, Madagascar (13–19 November 1996; E. Quinter), deposited in AMNH.

ETYMOLOGY—The specific name refers to the relatively high altitude at which the species was taken.

DIAGNOSIS—Females can easily be recognized by the large lateral epigynal openings and elevated, longitudinal, median epigynal ridge (Fig. 5-3).

MALE—Unknown.

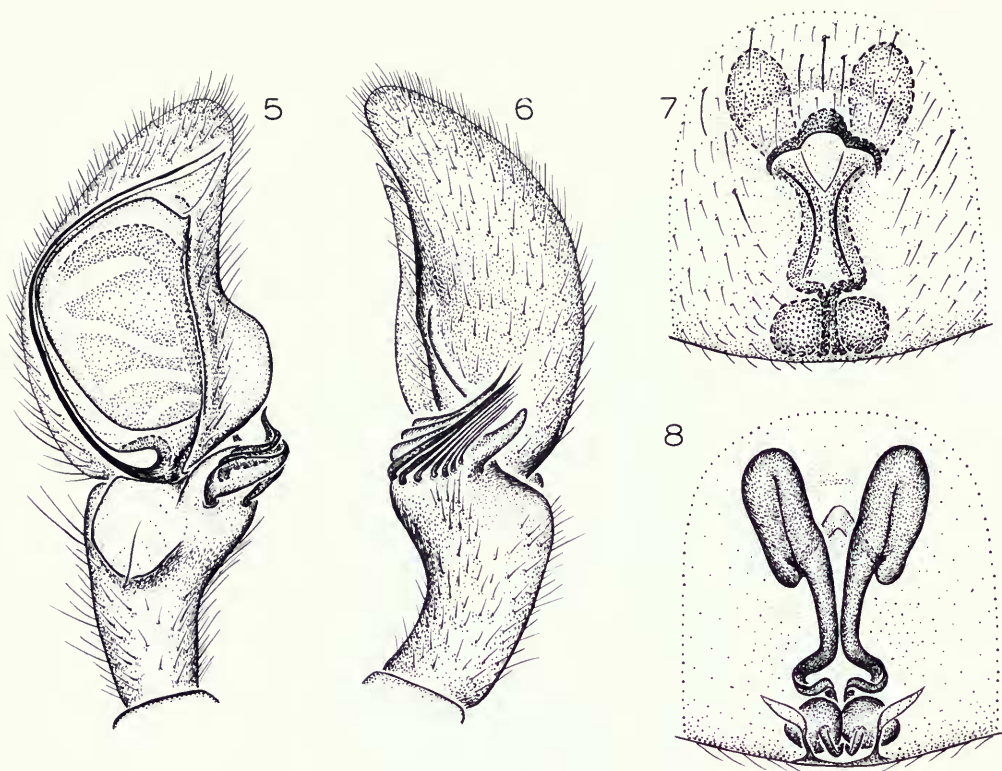
FEMALE—Total length, not including chelicerae, 8.8 mm. As in *P. griswoldi*, except for the following. Cheliceral promargin with four or five teeth. Epigynum with large, lateral openings and elevated, longitudinal median ridge (Fig. 5-3); ducts not curled posteriorly (Fig. 5-4).

OTHER MATERIAL EXAMINED—One female taken with the holotype (AMNH).

Paccius griswoldi, new species

(Figures 5-5 to 5-8)

TYPES—Male holotype and female allotype taken on the forest floor at night at 700–800 m in



FIGS. 5-5 to 5-8. *Paccius griswoldi*, new species. 5, Left male palp, ventral view; 6, same, retrolateral view; 7, epigynum, ventral view; 8, same, dorsal view.

the Parc National de Marojejy, 8.4 km NNW of Manantenina, 14°26'S, 49°45'E, Antsiranana Province, Madagascar (12 November 1993; C. Griswold), deposited in USNM.

ETYMOLOGY—The specific name is a patronym in honor of the collector of the types.

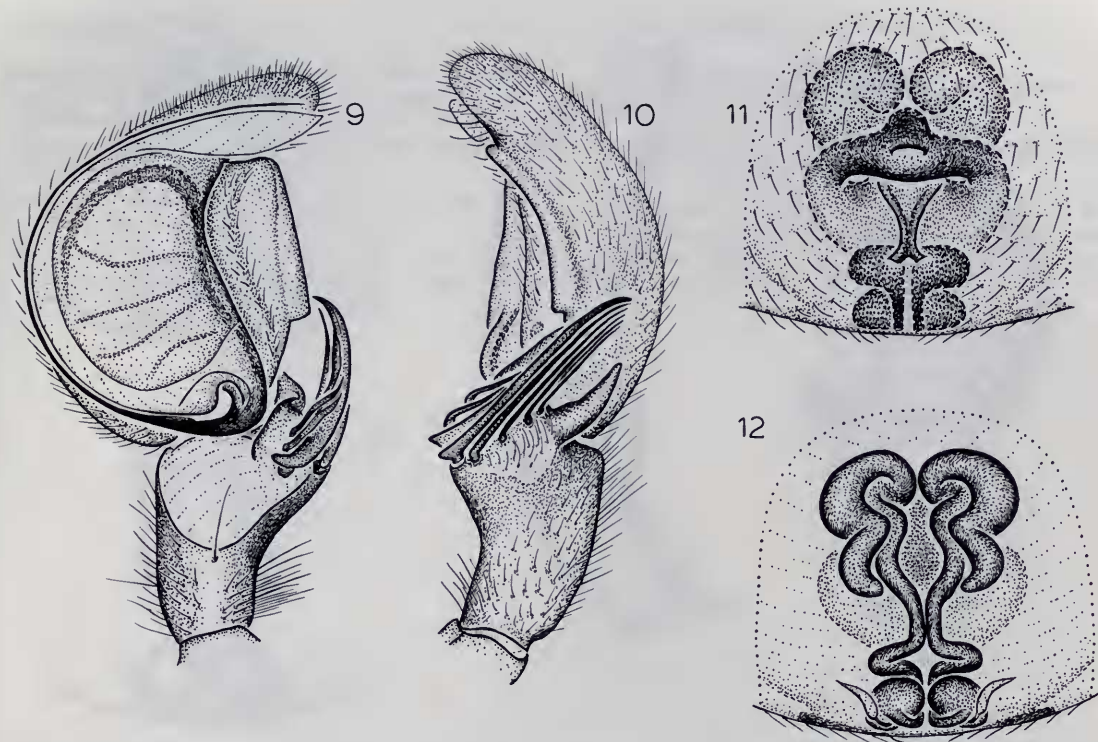
DIAGNOSIS—Males resemble those of *P. madagascariensis* but have a much smaller retrolateral expansion on the cymbium (Fig. 5-5) and have the tip of the tibial apophysis well removed from (rather than touching) the modified setae (Fig. 5-6). Females resemble those of *P. quinteri* in having long, straight median epigynal ducts, but differ in having those ducts curled posteriorly (Fig. 5-8).

MALE—Total length, not including chelicerae, 9.3 mm. As in *P. angulatus*, except for the following. Cheliceral promargin with five teeth. Abdominal venter with longitudinal rows of sclerites completely encased within large, orange ventral scutum. All setae associated with retrolateral tibial apophysis enlarged; median boat-shaped seta crossed by two more distal setae, more proximal setae forming thick white brush well separated

from digitiform tip of tibial apophysis (Fig. 5-6); cymbium with retrolateral expansion occupying only about one-fourth of cymbial length (Fig. 5-5); embolar base distinctly excavated.

FEMALE—As in male *P. angulatus*, except for the following. Total length, not including chelicerae, 10.9 mm. Cheliceral promargin with five teeth. Epigastric scutum restricted to sides and venter; dorsal scutum restricted to small sclerite above pedicel, on anterior surface of abdomen; abdominal dorsum pale gray, with two pairs of darker cardiac spots; venter pale gray, with two longitudinal rows of few dark spots. Posterior median and posterior lateral spinnerets each with two and one cylindrical gland spigots, respectively, but posterior medians shaped as in male. Palpal tibia and tarsus with elongated setae but without spines; tarsal claw long, apparently smooth. Epigynum with small hood and long, depressed atrium (Fig. 5-7); ducts recurved anteriorly, curled posteriorly (Fig. 5-8).

OTHER MATERIAL EXAMINED—MADAGASCAR: Antsiranana: PN de Marojejy, 8.4 km NNW of Manantenina, 14°26'S, 49°45'E, 700–800 m,



FIGS. 5-9 to 5-12. *Paccius scharffi*, new species. 9, Left male palp, ventral view; 10, same, retrolateral view; 11, epigynum, ventral view; 12, same, dorsal view.

11-14 November 1993, beating foliage, on forest floor and foliage at night (C. Griswold, N. Scharff, USNM), 1♂, 4♀; tributary, Manantenina River, PN de Marojejy, 10.0 km NW of Manantenina, 14°26.0'S, 49°45.7'E, 15-22 October 1996, beating vegetation, 750 m (E. Quinter, T. Nguyen, AMNH), 1♀.

***Paccius scharffi*, new species**
(Figures 5-9 to 5-12)

TYPE—Male holotype and female allotype taken on foliage at 700-800 m in the Parc National de Marojejy, 8.4 km NNW of Manantenina, 14°26'S, 49°45'E, Antsiranana Province, Madagascar (12-14 November 1993; N. Scharff, J. Coddington), deposited in USNM.

ETYMOLOGY—The specific name is a patronym in honor of the collector of the holotype.

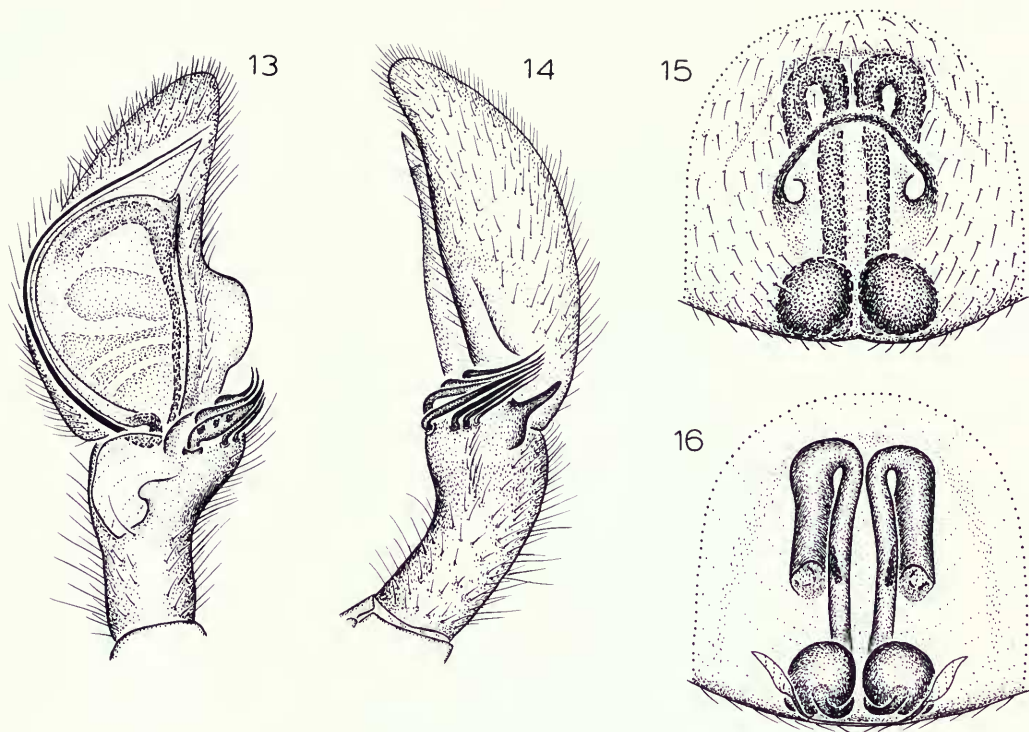
DIAGNOSIS—Males resemble those of *P. mucronatus* in having a relatively large cymbial expansion (Fig. 5-9), but they can be distinguished by the angular proximal corner of the cymbial expansion (Fig. 5-9) and the longer tip of the retro-

lateral tibial apophysis (Fig. 5-10). Females can be recognized by the transverse epigynal hood (Fig. 5-11) and anteriorly expanded epigynal ducts (Fig. 5-12).

MALE—Total length, not including chelicerae, 6.8 mm. As in *P. angulatus*, except for the following. Abdominal venter with longitudinal rows of sclerites completely encased within large, orange ventral scutum. All setae associated with retrolateral tibial apophysis enlarged; median boat-shaped seta crossed by two more distal setae, more proximal setae forming thick white brush, well separated from elongate, granulate tip of tibial apophysis (Fig. 5-10); cymbium with retrolateral expansion occupying over half of cymbial length, situated more distally than in other species (Fig. 5-9); embolar base elongated, excavated.

FEMALE—Total length, not including chelicerae, 6.6 mm. As in *P. griswoldi*, except for the following. Cheliceral promargin with four teeth. Epigynum with small anterior pocket, transverse hood, and wide, deeply depressed atrium (Fig. 5-11); ducts thickened, recurved anteriorly, curled posteriorly (Fig. 5-12).

OTHER MATERIAL EXAMINED—None.



FIGS. 5-13 TO 5-16. *Paccius quinteri*, new species. 13, Left male palp, ventral view; 14, same, retrolateral view; 15, epigynum, ventral view; 16, same, dorsal view.

***Paccius quinteri*, new species**
(Figures 5-13 to 5-16)

TYPES—Male holotype and female allotype taken in a yellow pan trap set at 1625 m along a tributary at head of Andranomifototra River, 10.5 km NW of Manantenina, in the Parc National de Marojejy, 14°26.4'S, 49°44.5'E, Antsiranana Province, Madagascar (6–12 November 1996; E. Quinter), deposited in AMNH.

ETYMOLOGY—The specific name is a patronym in honor of the collector of the types.

DIAGNOSIS—Males resemble those of *P. madagascariensis* but have a much smaller retrolateral expansion on the cymbium (Fig. 5-13) and a sharply narrowed tip of the retrolateral tibial apophysis (Fig. 5-14). Females can be recognized by the small anterolateral epigynal openings (Fig. 5-15) and long straight epigynal ducts (Fig. 5-16).

MALE—Total length, not including chelicerae, 8.0 mm. As in *P. angulatus*, except for the following. Abdominal venter with longitudinal rows of sclerites completely encased within large orange ventral scutum. All setae associated with retrolateral tibial apophysis enlarged; median boat-

shaped seta crossed by two more distal setae, more proximal setae forming thick white brush, well separated from subdistally sharply narrowed tip of tibial apophysis (Fig. 5-14); cymbium with retrolateral expansion occupying about one-fourth of cymbial length (Fig. 5-13); embolar base excavated, recessed behind soft tissue of tibial tip.

FEMALE—Total length, not including chelicerae, 5.3 mm. As in *P. griswoldi*, except for the following. Cheliceral promargin with four teeth. Only two or three denticles on metatarsi I, none on tarsi I or leg II. Epigynum with small anterolateral openings (Fig. 5-15); ducts long, straight, recurved anteriorly, not curled posteriorly (Fig. 5-16).

OTHER MATERIAL EXAMINED—None.

Acknowledgments

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